CLAIMS

1. In a pulsation reducing system for a fuel line of an electronic fuel injection type engine comprising a fuel delivery rail (15) for supplying fuel to fuel injectors (19), a fuel tank (12), and a longitudinal main fuel pipe (13) for connecting the fuel tank to the fuel delivery rail, characterized in that:

a first flexible tube (17) is arranged between said fuel delivery rail and said main fuel pipe,

a second flexible tube (18) is arranged between said main fuel pipe and said fuel tank,

a small-ID tubular portion (22) is arranged within said first tube or near the connecting portion of said first tube,

the inside diameter of said small-ID tubular portion is smaller than that of said main fuel pipe,

the length of said small-ID tubular portion is set between 10 to 50 times of the inside diameter of the small-ID tubular portion itself, whereby;

standing waves and resultant pressure pulsations caused by said fuel delivery rail are reduced by said small-ID tubular portion.

2. A pulsation reducing system as claimed in claim 1, wherein the sectional flow area of said small-ID tubular portion is set between 5 to 40 percent of the sectional flow area of said main fuel pipe.

3. A pulsation reducing system as claimed in claim 1, wherein said small-ID tubular portion is formed as a protrusion extending from the end of said fuel delivery rail.

4. A pulsation reducing system as claimed in claim 1, wherein said small-ID tubular portion is formed into a pipe inserted within said first tube.

5. A pulsation reducing system as claimed in claim 1, wherein said small-ID tubular portion is integrally formed within said first tube.

6. A pulsation reducing system as claimed in claim 1, wherein said small-ID tubular portion is formed as a protrusion extending from the end of said main fuel pipe.

7. A pulsation reducing system as claimed in claim 1, wherein said small-ID tubular portion is formed on said main fuel pipe.

8. A pulsation reducing system as claimed in claim 1, wherein said small-ID tubular portion is formed as a protrusion extending inside of said fuel delivery rail.

9. A pulsation reducing system as claimed in claim 1, wherein a quick-joint connector (92) is connected to said first tube, and said small-ID tubular portion is formed within said quick-joint connector.

10. In a pulsation reducing flexible tube for a fuel line of an electronic fuel injection type engine comprising a fuel delivery rail (15) for supplying fuel to fuel injectors (19), a fuel tank (12), and a longitudinal main fuel pipe (13) for connecting the fuel tank to the fuel delivery rail, characterized in that:

said flexible tube (17) is provided with a first cavity (54) at one end thereof for receiving an end of said main fuel pipe and a second cavity (52) at the other end thereof for receiving an end of said fuel delivery rail,

a small-ID tubular portion (28) is arranged between said first and second cavities so as to communicate with them,

the sectional flow area of said small-ID tubular portion is set between 5 to 40 percent of the sectional flow area of said main fuel pipe.

the length of said small-ID tubular portion is set between 10 to 50 times of the inside diameter of the small-ID tubular portion itself, whereby;

standing waves and resultant pressure pulsations caused by said fuel delivery rail are reduced by said small-ID tubular portion.

11. In a pulsation reducing quick-joint connector for a fuel line of an electronic fuel injection type engine comprising a fuel delivery rail (15) for supplying fuel to fuel injectors (19), a fuel tank (12), and a longitudinal main fuel pipe (13) for connecting the fuel tank to the fuel delivery rail, characterized in that:

said connector (92) is provided with a rugged surface (93) at one end thereof for receiving an end of an elastic tube and a cavity (94) at the other end thereof for receiving an end of a metallic or plastic tube,

a small-ID tubular portion (97) is arranged at the center of the rugged surface,

the sectional flow area of said small-ID tubular portion is set between 5 to 40 percent of the sectional area of said main fuel pipe.

the length of said small-ID tubular portion is set between 10 to 50 times of the inside diameter of the small-ID tubular portion itself, whereby;

standing waves and resultant pressure pulsations caused by said fuel delivery rail are reduced by said small-ID tubular portion.